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Aster tardiflorus and its forms.

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Probably no New England Aster has caused more confusion and has been less understood than *Aster tardiflorus* L. The plant was described by Linnaeus in 1763 from garden specimens introduced from northeastern America. These plants were low and weak, and grew in the Upsala garden for eighteen years before flowering, and then blossomed late in the season. Linnaeus described it as a smooth plant two feet high, with few axillary divaricate branches: the larger leaves spatulate-lanceolate, semi-amplexicaul, and serrate in the middle; the others decurrent at the base: flowers as in *A. Novi-Belgii*; the inner scales of the imbricated involucre longer than the outer.

In 1783 Lamarck described *A. patulus*, a plant brought to the Paris garden from northeastern America. Lamarck's plant was low and weak, two or three feet high, somewhat branching: the leaves smooth, ovate-lanceolate, sharply serrate, and a little narrowed at the base. From that time on a number of species were described from garden plants and subsequently referred either to *A. tardiflorus* or to *A. patulus*.

In the Flora of North America, Torrey and Gray placed both *A. tardiflorus* and *A. patulus* in the group of species described from garden specimens which had not been identified with native plants. Instead of using the Linnaean description of *A. tardiflorus*, however, they followed Nees von Esenbeck, whose plant is a form of *A. Novi-Belgii* L., adding in a note that, according to Lindley, the Linnaean plant is *A. patulus* Lam. *Aster patulus*, though then unknown in the wild state, seems to have been better understood by Torrey and Gray. They followed the description of Lamarck and added the note that "the cultivated plant has much the habit of *A. cordifolius*, etc., except that none of the leaves are cordate." Other characters are given which show that they had a definite conception of the species.

In his "Studies of Aster and Solidago in the older herbaria,"¹ Dr. Gray says in discussing the Linnaean types: "*A.*

¹ Proc. Amer. Acad. 17: 167.

tardiflorus, founded entirely on specimens cultivated in the Upsal garden, is confidently identified with a low form of *A. patulus* Lam." And in the Gray herbarium there are European garden specimens which Dr. Gray has matched with the Linnaean sheets of *A. tardiflorus*, and which, at the same time, are not distinguishable from authentic specimens of *A. patulus* from the Paris garden. But in the Synoptical Flora of North America there is an attempt to distinguish the two species on the two characters in which the original descriptions did not coincide. Namely, *A. tardiflorus* is described as having leaves auriculate at base and essentially equal involucre bracts, with some of the outer foliaceous, while the leaves of *A. patulus* are described as attenuated at the base, and the involucre bracts more or less unequal. Various specimens, however, show that these characters are not permanent; there are well authenticated plants of *A. patulus* with leaves slightly auriculate and with involucre bracts subequal as in *A. tardiflorus* and *vice versa*. In fact it seems that by attempting to keep these species apart we are only making confusion.

The obscurity surrounding the Linnaean plant, as recently understood, and its ascribed characters of auriculate leaves and of outer foliaceous bracts have allowed many specimens of *A. Novi-Belgii*, and a few plants of *A. puniceus* to be placed with *A. tardiflorus*. *Aster tardiflorus* as a rule is a species very distinct from both *A. Novi-Belgii* and *A. puniceus*, though there are some forms which show a close relationship to those species. In general habit, however, the typical plant suggests *A. prenanthoides*, or species of the sub-genus HETEROPHYLLI (particularly *A. Lindleyanus*) and it apparently intergrades with them.

It is with the hope to throw some clearing light upon the confusion which has prevailed that I have given this outline of the history of these plants and append the following descriptions.

ASTER TARDIFLORUS L.—A rather slender plant from a span to three feet high, bearing few heads in a terminal cyme or many in a leafy open inflorescence: stems glabrous, or slightly hirsute above, or even white-villous in some more northern specimens: leaves thinnish, those of the radical shoots oblong or spatulate, crenate, on winged petioles; cauline leaves lanceolate to ovate-lanceolate, acuminate, tapering gradually to a sessile or slightly auriculate base; the leaves

often gradually contracted to a winged petiole; leaves above glabrous or somewhat scabrous, beneath from glabrous to villous-pubescent, especially on the midrib; margin nearly or quite entire toward the apex and the base, but in the middle portion bearing regular coarse and sharp serrations, or rarely without serrations, particularly on the upper leaves: heads three to five lines high: bracts of the involucre sub-equal or indefinitely two- or three-seriate, linear to linear-subulate, acute or short acuminate, mostly ciliate, green toward the tip and down the midrib; the outer sometimes entirely foliaceous: rays pale violet, flesh colored, or almost white.—Spec. 2: 1231. [Ed. 2], not of Willd. Spec. 3: 2049. *A. patulus* Lam. Dict. 1: 308. *A. Tradescanti* Hoffm. Phyt. Blatt. 86, pl. D. fig. 2, not of L. Spec. 2: 876. *A. pallens* Willd. Enum. Suppl. 58. *A. praecox* Willd. l. c. *A. abbreviatus* Nees, Syn. Ast. 16. *A. Cornuti* Wendl. ex Nees, Gen. et Sp. Ast. 58. *A. acuminatus* Nees, l. c. 60. *A. vimineus* Nees, l. c. 68 in part.—In low woods, generally along streams, New Brunswick and New England, flowering from late August through October.

Specimens have been examined from the following stations:

New Brunswick: Keswick (John Brittain); Campbellton (R. Chalmers).

Maine: St. John River (Kate Furbish); Dover (M. L. Fernald); Mt. Desert Island (E. L. Rand, E. Faxon); Farmington (C. H. Knowlton); Woodstock (J. C. Parlin).

New Hampshire: Shelburne (E. Faxon); Bethlehem (E. Faxon, G. G. Kennedy). Lisbon (E. Faxon); Franconia (E. and C. E. Faxon, G. G. Kennedy).

Vermont: Smugglers Notch, very small plants with from one to three heads (C. E. Faxon); Sutton, near Willoughby Lake (E. Faxon); Newfane (A. J. Grout).

Massachusetts: Blue Hills, Quincy (G. G. Kennedy); New Bedford (A. W. Hervey).

Connecticut: Bolton (C. Wright), a somewhat doubtful plant.

ASTER TARDIFLORUS L., var. *lanceifolius*, n. var.—Rather taller than the species, glabrous or slightly pubescent above: the leaves glabrous or sparingly ciliate on the margin, elongated-lanceolate, 3 to 6ⁱⁿ in length, 6 to 10 times as long as broad, tapering above to an entire long-acuminate tip and below to a slightly amplexicaul base; the teeth in the middle

portion very stout and generally hooked, more scattered than in the type (sometimes half an inch apart): branches of the inflorescence few-flowered and short, rarely more than two-thirds as long as the leaves.—Growing in lower ground and generally a coarser appearing plant than the type, but passing into it.—In wet meadows and on shores with much the same range as the species.

Maine: St. Francis (M. L. Fernald); Mt. Desert Island (M. L. Fernald, E. L. Rand); Woodstock (J. C. Parlin); Farmington (C. H. Knowlton); South Poland (Kate Furbish).

Massachusetts: Ashland (Thos. Morong); Boylston Station, Boston (E. and C. E. Faxon); West Roxbury (C. E. Faxon); Jamaica Plain (E. Faxon).

Aster puniceus × **tardiflorus**, var. **lancifolius**, n. hyb.—A rather stout plant $1\frac{1}{2}$ to 2" high, simple or sparingly branched above: the purple or purple-tinged stem hispid with coarse spreading white hairs: leaves thick and leathery in texture, coarsely serrate in the middle; root-leaves elongated-spatulate, glabrous; cauline oblong-lanceolate, 3 to 6" long, $\frac{1}{2}$ to 2" wide, broadest above the middle; from the broadest portion tapering abruptly to an acuminate tip, and gradually to an auriculate base; above strongly scabrous, beneath glabrous or sparingly scabrous, and somewhat hispid on the broad white midrib: inflorescences leafy or naked, simply, or two-five-flowered and corymbose, in the axils of the upper leaves, only an inch or two high (barely half as long as the leaves): heads 4 to 6" high, an inch or so broad; bracts of the involucre narrowly linear, three to four lines long, erect, loosely imbricated, mostly in one series, but with a shorter secondary outer series: rays pale violet.—Collected with *A. tardiflorus*, var. *lancifolius* in a meadow at Ashland, Mass., Oct. 24, 1878, by the late Thomas Morong; in marshes along the Mystic river, at Medford, Mass., Oct., 1893 and '94, by B. L. Robinson and M. L. Fernald; and at Beaver brook, Waverly, Mass., Oct., 1894, by G. L. Chandler. A plant combining the characteristics of *A. puniceus* and *A. tardiflorus*, var. *lancifolius*. The purple hispid stem suggestive of *A. puniceus*, is generally more slender than in that species, though stouter than in *A. tardiflorus*. The leaves are broader than in *A. tardiflorus*, var. *lancifolius*, but the coarse serration of the middle portion, and the cuneate lower portion are like

that species; the auricled base, scabrous upper surface, and hispid midrib, however, are like *A. puniceus*. The inflorescence is decidedly like *A. tardiflorus*, var. *lancifolius*: the corymbs are much shorter than the leaves, but in well developed *A. puniceus* the leaves are shorter than the inflorescence. The scales of the involucre, too, are almost identical with those of *A. tardiflorus*, while in *A. puniceus* they are much longer, more lax and more distinctly uni-seriate. The rays are light violet like those of *A. tardiflorus*, not deep violet as in ordinary *A. puniceus*. The achenes in the intermediate form are all immature and show no striking characters. In working over the Asters for the Synoptical Flora of North America, Dr. Gray referred the Ashland plant to *A. puniceus*; but the sheet bears a note in his handwriting, apparently added sometime later, which suggests that the plant may be a hybrid with *A. patulus*. As this peculiar intermediate form seems to be restricted to a small portion of Middlesex county, I have ventured to follow this suggestion of Dr. Gray in placing the plant as above.

Gray Herbarium, Cambridge, Mass.